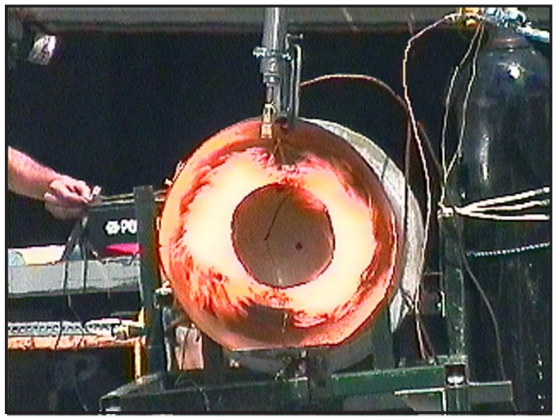
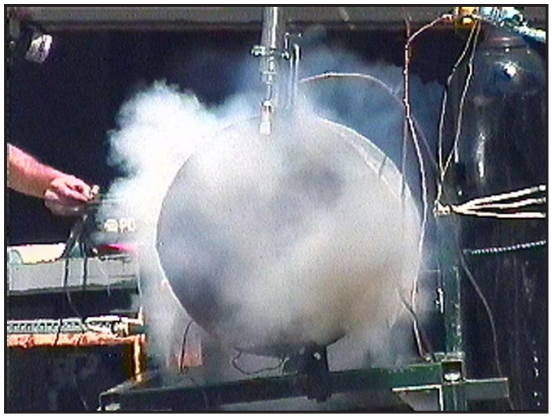
New Fire Extinguishing Material for Aircraft Outperforms Halons Without Endangering Ozone Layer

26





Payoff

The new material (patent pending) is a highly effective alternative that will result in fire suppression systems in aircraft that are lighter and smaller than existing systems. Its high potency, low cost and zero threat to the ozone layer makes it a promising candidate for a wide spectrum of military and commercial applications.

Accomplishment

A team effort led by scientists at the Materials and Manufacturing Directorate, and supported by a Small Business Innovation Research program with Huntington Research and Engineering (HRE) of San Jose CA, has led to the discovery of a promising new aircraft fire extinguishing material that has characteristics superior to the environmentally-banned Halon 1301. This new material is several hundred times more potent and about one hundred times less expensive than the halons it would replace while posing no threat to the ozone layer.

Background

Although halons make up only a small percentage of ozone depleting substances, they are responsible for approximately 23 percent of the ozone destruction observed in recent years. When halons are released into the lower atmosphere, they do not break down. Instead, they diffuse to the stratosphere within a year, where they are fragmented by the sun's ultraviolet light to release free halogen atoms that cause ozone depletion. The production of halons was banned in 1994 by international agreements for all applications including extinguishing aircraft fires. However, since an alternative aircraft fire extinguishing material was not available and flight safety regulations have required the continued use of halons on aircraft, the price of halons has escalated and stockpiles have become depleted. To investigate new materials to suppress fires in aircraft engines, a jet engine simulator was built at HRE's test range. Hundreds of tests were conducted in this simulator with a wide range of new materials including solid powders, slurries, liquids and gases. The new class of fire suppression compositions extinguished 500 kilowatt fires using gram quantities of materials (25 cents worth). Since similar fires require kilogram quantities of Halon 1301, there is a potential application for this improved fire suppression material in aircraft. The research team included researchers from the Air Vehicles Directorate, the California Institute of Technology and the University of Texas.